as the "spacing density" (page 13, line 20) is noted. The specification has been amended to make the specification more clear by using the term "spacing density" when referring to D(x). A "new" page 13 of the specification incorporating the proposed changes to the specification and a "marked-up" copy of page 13 showing the proposed changes are attached hereto.

In view of the foregoing, the objections to the specification should be withdrawn.

The rejection of Claims 1 - 11 as being rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention is respectfully traversed.

The Examiner has taken the position that Claims 1 and 9, do not clearly indicate how the method disclosed reduces the tensile stress in the surface of a part.

The Applicant respectfully submits that as taught in the subject specification, by decreasing the magnitude of compression in the direction towards the boundaries of the selected region will result in the reduction or elimination of high tensile stress zones along the boundaries of the selected region. The Applicant, however, has amended Claims 1 and 9 to more clearly indicate how the claimed method reduces the tensile stress in the surface of a part.

In view of the foregoing, the Applicant respectfully submits that the rejection of Claims 1 - 11 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention should be withdrawn.

The rejection of Claims 1 - 11 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,826,453 to Prevey, III is respectfully traversed.

The Examiner takes the position that independent Claims 1 and 9, as well as all dependent claims, are anticipated by Prevey, III. Referring to Claim 1, the Examiner appears to take the position that Claim 1 discloses a pressure applied such that the magnitude of compression decreases in the direction towards the boundaries of the selected region and that this method is inherently

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disclosed in Col. 8, lines 57 - 59, of Prevey, III since a zone of deformation is formed by compressions of different magnitudes that are exerted over a surface in a selected pattern.

When a reference does not expressly recite or disclose a claimed invention, but following the disclosure necessarily produces the claimed subject matter, the reference inherently amticipates under Section 102. However, in order for this to be so, following the reference teaching must **inevitably produce the claimed subject matter**. The Applicant respectfully submits that independent Claims 1 and 9, requires "pressure being applied such that the magnitude of compression decreases in the direction towards the boundaries of the selected region" (Claim 1) or "density of burnishing and the magnitude of compression are varied to reduce the high tensile stress zones along the boundaries of the selected region" (Claim 9). In contrast, the method disclosed in Prevey III, *permits* a process whereby pressure may increase, decrease, or stay the same in the direction towards the boundaries of the selected region and **does not require** that the density and/or direction of burnishing and the magnitude of compression be varied to reduce the high tensile stress zones along the boundaries of the selected region. Indeed, there **must be a selection process** to arrive at the *right* process for achieving the desired result. Accordingly, the results of the claimed method, i.e. that of minimizing "the effects of any tensile stress zones near the boundaries" (Claim 1) or reducing "the high tensile stress zones along the boundaries of the selected region" **are not inevitable** and are therefore **not inherent** in the method taught in Prevey III. Accordingly Claims 1 - 11 of the subject application is not anticipated by the cited reference.

In view of the foregoing, the rejection of Claims 1 - 11 as being rejected under 35 U.S.C. 102(b) as being anticipated by Prevey, III should be withdrawn.

Conclusion:

In view of the foregoing amendments and remarks, it is respectfully submitted that all of the Claims now pending are allowable over the art of record. Reconsideration of all claims now in this application is respectfully requested.

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Respectfully submitted,

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MARKED UP COPY OF AMENDMENTS TO CLAIMS

1. (Amended) A method of reducing zones of high tensile stress in the surface of a part comprising the steps of:

selecting a region of the part to be treated; and

exerting pressure against the surface of the selected region, the pressure being applied such that the magnitude of compression decreases in the direction towards the boundaries of the selected region <u>to minimize the effects of any tensile stress zones near the boundaries</u>.

9. (Amended) A method of reducing high tensile stress zones in the surface of a part comprising the steps of:

selecting a region of the part to be treated; and

programming a control unit of a burnishing apparatus to perform a burnishing operation, the burnishing operation being performed such that the density of burnishing and the magnitude of compression are varied to reduce the high tensile stress <u>zones</u> along the boundaries of the selected region.

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MARKED UP COPY OF AMENDMENTS TO SPECIFICATION

the part in a particular (raster) pattern, as shown by the arrow indicating the path of the burnishing member. The normal force (Fz) being applied to the burnishing member is varied to increase or decrease the pressure being exerted against the surface of the part. While **FIG. 4** shows a linear variation in the normal force and the corresponding pressure being applied against the surface, parallel (X-direction) and perpendicular (Y-direction) to the direction of burnishing, it should now be apparent to those skilled in the art that the pattern of burnishing and the form and rate of reduction or increase in pressure being exerted against the surface can be controlled to provide a wide variety of residual stress distributions and magnitude of compression.

Referring to **FIG. 5**, another illustration of the method of the present invention is shown whereby variations in residual stress distribution may also be achieved by varying the pattern of burnishing, independently or in conjunction with variations in burnishing pressure. As shown, the spacing along the X-direction, perpendicular to the direction of travel of the burnishing member, has been varied to increase and decrease the spacing between each pass of the burnishing member thereby changing the density (Dx) of burnishing <u>(spacing density)</u>. As shown, the spacing between each pass of the burnishing member varies linearly, however, it should now be apparent to those skilled in the art that other burnishing patterns may be selected to produce the desired residual stress distribution.

Referring to **FIG. 6**, another pattern of burnishing is shown whereby the [spacing] density <u>of burnishing</u> (Dx) is varied in two dimensions (X and Y directions) as a function of the length of the burnishing pass, in order to produce the desired stress distribution for the part being burnished.

Referring to **FIG. 7**, another pattern of burnishing is shown whereby a region is designated and the magnitude of compression and the residual stress distribution is selected that optimizes the fatigue performance of the part. As shown, the residual stress distribution has a symmetrical pattern such as what would be preferred for use around

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